

A FLORISTIC SURVEY OF EIGHT COAL SITES IN THE
DECKER, MONTANA-SHERIDAN, WYOMING AREA.*

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Abstract: A floristic survey of proposed, operational, and abandoned coal strip mine sites resulted in an annotated checklist of 407 vascular plant species in 236 genera and 63 families. Habitat and occurrence (i.e. Montana and/or Wyoming) of each species is included. The checklist is prefaced by a characterization of climate, topography, and major plant community types.

A floristic survey of three study sites in Sheridan County, Wyoming and five sites in Big Horn County, Montana (Fig. 1) was conducted in spring and summer of 1976 and 1977, while the authors were employed by Peter Kiewit Sons' Co., Mining Reclamation Department, Sheridan, Wyoming. These study sites are in and around proposed, operational, and abandoned coal strip mine areas.

All of the study sites are located in the Tongue River drainage. This river flows northeast from the Big Horn Mountains in Wyoming and along the northwestern border of the Powder River Basin toward its confluence with the Yellowstone River at Miles City, Montana. The southern-most study site at Acme, Wyoming is located seven miles north of Sheridan, Wyoming at the confluence of Tongue River and Big Goose Creek. Of the eight study sites, two contain only intermittent watercourses, one contains a perennial creek, and the other five border the Tongue River. Occasional low-lying areas along the river support riparian woodland with a canopy of Populus deltoides Marsh., Fraxinus pennsylvanica Marsh., and Acer negundo L. Understories are variable. Although many plant species are found in riparian situations (riparian woodlands, open places along watercourses, freshwater marshes, and temporary ponds), these habitat types represent a very small portion of the study areas.

* We are grateful to Peter Kiewit Sons' Co., Mining Reclamation Department for supporting this study.

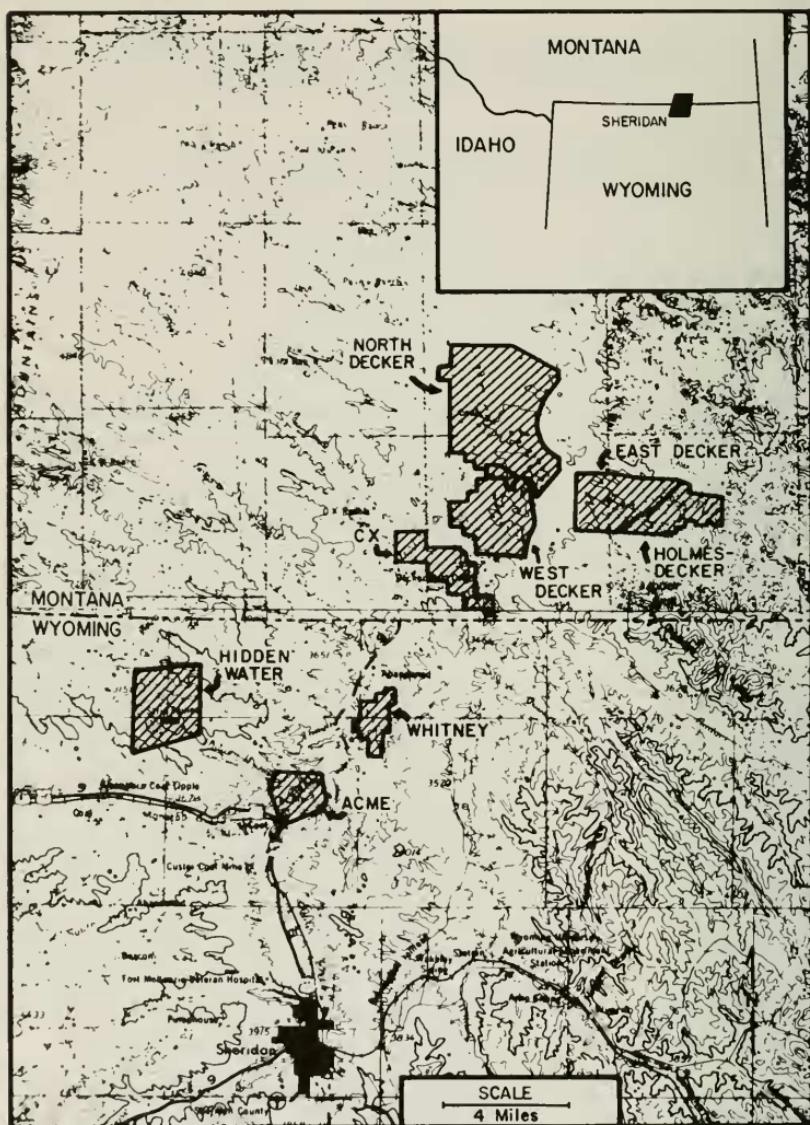


Figure 1. Locations of floristic survey areas.

Elevations on the sites range from 3400 to 4200 feet. Relatively level or mildly rolling plains adjoin the river in some places. These are cut by several ephemeral watercourses which are usually dry, but carry large amounts of water during periods of spring runoff and heavy rainfall. This low-lying topography gives way abruptly to eroded hills with prominent rocky outcroppings. Upslope, the hills grade into benchlands which are irregularly dissected by deep valleys with shallower washes and draws. There are also level uplands which are somewhat rolling but not heavily dissected by gullies.

The predominant vegetation type is sagebrush-grassland. This semi-arid habitat has more floristic diversity than the riparian habitats because of its larger area, but presents a very uniform appearance due to the presence of big sagebrush (Artemisia tridentata Nutt.). Big sagebrush and associated grasses and forbs form an extensive savanna which is interrupted by patches of grassland. There is a continual succession of plant species appearing in the sagebrush-grassland from early spring to late fall. Many species of Astragalus bloom in spring and early summer. Sunflowers (Helianthus spp.), goldenrods (Solidago spp.), and other Compositae add color to the landscape in mid- and late summer. Heavy utilization of the sagebrush-grassland for grazing may account for the abundance of species unpalatable to cattle such as Artemisia tridentata Nutt., Chrysothamnus nauseosus (Pall.) Britt., and Opuntia polyacantha Haw. (U.S. Geological Survey and Montana Department of State Lands, 1977). Other species common in the sagebrush-grassland association include Agropyron cristatum (L.) Gaertn., Agropyron smithii Rydb., Agropyron spicatum (Pursh) Scribn. & Smith, Bromus japonicus Thunb., Bromus tectorum L., Chenopodium spp., Poa spp., Stipa comata Trin. & Rupr., and Stipa viridula Trin. In the more mesic areas of the sagebrush-grassland, silver sagebrush (Artemisia cana Pursh) is common.

Low-lying saline areas are sometimes characterized by an interesting group of salt tolerant species including Bassia hyssopifolia (Pall.) Kuntze, Distichlis stricta (Torr.) Rydb., Hordeum pusillum Nutt., and Suaeda occidentalis Wats.

Ponderosa pine-juniper woodland (Pinus ponderosa Dougl. and Juniperus scopulorum Sarg.) is found on some hillsides, especially lining the draws. On drier sites, this association might be better described as ponderosa pine-juniper savanna. Other hillsides support a more dense stand of pine, with fewer junipers.

In between the extremes of habitat represented by the low-lying riparian woodlands and the windswept rocky hilltops, there are many other plant associations, habitats, and microenvironments.

Mean monthly temperatures at Sheridan, Wyoming range from 21° F. in January to 72° F. in July (Becker and Alyea, 1964a), and are comparable to Decker, Montana mean monthly temperatures of 20° F. in January to 70° F. in July (U.S. Geological Survey and Montana Department of State Lands, 1977). Mean annual precipitation at Sheridan, Wyoming is 16 inches with about 10.6

inches falling during April through September (Becker and Alyea, 1964b). Mean annual precipitation of 11.8 inches at Decker, Montana is about 25% less than at Sheridan, Wyoming. Precipitation can vary considerably from year to year. For example, Decker, Montana received 6.5 inches of precipitation in 1960 and 17.6 inches in 1968 (U.S. Geological Survey and Montana Department of State Lands, 1977).

Primary reference sources for plant identifications and nomenclature included Hitchcock et al. (1955-1969), Booth and Wright (1959), Hahn (1973), Hitchcock and Chase (1950), Harrington (1964), and Munz and Keck (1959). A reference herbarium of these collections has been established at Peter Kiewit Sons' Co., Mining District, Sheridan, Wyoming. Voucher specimens have been deposited also in the following herbaria: California State University, Chico (CHSC); University of Montana (MONTU); and the University of Wyoming (RM) (herbarium abbreviations from Holmgren and Keuken, 1974).

In the following species list, the families are arranged alphabetically under horsetails, ferns, gymnosperms, and angiosperms (Dicotyledonae and Monocotyledonae). Genera and species are arranged alphabetically within their respective families. The following abbreviations are used to designate whether each plant was found in Montana and/or Wyoming, and the habitat type(s) in which each occurs.

M	Montana	pj	ponderosa pine-juniper
W	Wyoming	rb	river bank
aq	aquatic	rh	rocky hillsides
cb	creek banks	rm	reclaimed mine lands
da	disturbed areas	ro	rocky outcroppings
fm	freshwater marshes	rw	riparian woodlands
fp	flood plains	sa	saline areas
gr	grasslands	sg	sagebrush-grassland
iw	intermittent watercourses	tp	temporary ponds
or	open ridgetops	ws	widespread

HORSETAILS

EQUISETACEAE

Equisetum laevigatum A. Br. M, W; rb.

FERNS

ASPIDIACEAE

Cystopteris fragilis (L.) Bernh. M, W; iw, sg.
Woodsia oregana D. C. Eat. M; ro.

GYMNOSPERMS

CUPRESSACEAE

Juniperus horizontalis Moench. M, W; pj, sg.
Juniperus scopulorum Sarg. M, W; pj.

PINACEAE

Pinus ponderosa Dougl. M, W; pj.

ANGIOSPERMS
DICOTYLEDONAE

ACERACEAE

Acer negundo L. M, W; rw.

AMARANTHACEAE

Amaranthus graecizans L. M; da, rm, sg.
Amaranthus retroflexus L. M; da.

ANACARDIACEAE

Rhus trilobata Nutt. M, W; rh, ro, sg.
Toxicodendron radicans Kuntze. M, W; rw.

APOCYNACEAE

Apocynum androsaemifolium L. M; pj.
Apocynum sibiricum Jacq. M, W; iw, rw.

ASCLEPIADACEAE

Asclepias speciosa Torr. M, W; da, iw, rb.
Asclepias verticillata L. M; gr, rh.
Asclepias viridiflora Raf. M; iw, pj.

BORAGINACEAE

Asperugo procumbens L. W; rw.
Cryptantha bradburiana Pays. M, W; gr, sg.
Cryptantha kelseyan Greene. M; sg.
Cryptantha watsonii (Gray) Greene. M, sg.
Cynoglossum officinale L. W; rw
Hackelia deflexa (Wahlenb.) Opiz. M; rw.
Lappula echinata Gilib. M, W; gr, sg.
Lappula redowskii (Hornem.) Greene. M; gr, sg.
Lithospermum incisum Lehm. M, W; gr, sg.
Mertensia lanceolata (Pursh) A. DC. M; sg.
Myosotis laxa Lehm. W; rb.
Myosotis micrantha Pall. W; da, sg.
Onosmodium molle Michx. W; iw, rw.

CACTACEAE

Mammillaria vivipara (Nutt.) Haw. M; sg.
Opuntia polyacantha Haw. M, W; gr, sg.

CAMPANULACEAE

Campanula rotundifolia L. M, W; iw, pj.
Triodanis leptocarpa (Nutt.) Nieuwl. M; iw, sg.

CAPPARIDACEAE

Cleome serrulata Pursh. M, W; da, gr, sg.
Polanisia trachysperma T. & G. M; sg.

CAPRIFOLIACEAE

Symporicarpos albus (L.) Blake. W; pj.
Symporicarpos occidentalis Hook. M, W; rw.

CARYOPHYLLACEAE

Arenaria nuttallii Pax. M; or.
Cerastium arvense L. M, W; pj, rw.
Paronychia sessiliflora Nutt. M; or, pj.
Silene menziesii Hook. W; cb, rw.

CHENOPodiACEAE

- Atriplex argentea Nutt. M; rm, sg.
Atriplex canescens (Pursh) Nutt. M; rm.
Atriplex confertifolia (Torr. & Frem.) Wats. M; sa, sg.
Atriplex dioica (Nutt.) Macbr. M; sa, sg.
Atriplex nuttallii Wats. M, W; gr.
Bassia hyssopifolia (Pall.) Kuntze. M; sa.
Ceratoides lanata (Pursh) J. T. Howell. M, W; pj, sg.
Chenopodium album L. M, W; ws.
Chenopodium fremontii Wats. M; rw.
Chenopodium glaucum L. M; sa.
Chenopodium pratericola Rydb. M; rm.
Chenopodium rubrum L. M; gr.
Kochia scoparia (L.) Schrad. M, W; da, ws.
Monolepis nuttalliana (Schult.) Greene. M; da, sg.
Salsola kali L. M, W; da, rm.
Sarcobatus vermiculatus (Hook.) Torr. M; sa, sg.
Suaeda intermedia Wats. M; sa, sg.
Suaeda occidentalis Wats. M; gr, sa.

COMPOSITAE

- Achillea millefolium L. M, W; iw, pj, sg.
Agoseris glauca (Pursh) Raf. M, W; gr.
Ambrosia psilostachya DC. M, W; iw, sg.
Ambrosia trifida L. M, W; gr, iw, rw.
Antennaria dimorpha (Nutt.) T. & G. M; sg.
Antennaria rosea Greene. M, W; gr, pj, sg.
Arctium lappa L. M, W; rw.
Arnica sororia Greene. W; gr.
Artemisia absinthium L. W, rw.
Artemisia biennis Willd. M; rb.
Artemisia campestris L. M; gr, or, rh.
Artemisia cana Pursh. M, W; iw, sg.
Artemisia dracunculus L. M; sg.
Artemisia frigida Willd. M, W; gr, rh, sg.
Artemisia ludoviciana Nutt. M, W; iw, sg.
Artemisia tridentata Nutt. M, W; sg.
Aster brachyactis Blake. M; cb, tp.
Aster ciliolatus Lindl. W; rw.
Aster falcatus Lindl. M, W; da, gr, sg.
Aster hesperius Gray. M; cb.
Bahia oppositifolia (Nutt.) DC. M, W; da, gr, sg.
Balsamorhiza sagittata (Pursh) Nutt. W; gr.
Bidens vulgata Greene. M; cb, tp.
Chaenactis douglasii (Hook.) H. & A. M; rh, sg.
Chrysopsis villosa (Pursh) Nutt. M, W; gr, rh, sg.
Chrysothamnus nauseosus (Pall.) Britt. M, W; rh, sg.
Cirsium arvense (L.) Scop. M, W; da, cb, sg.
Cirsium undulatum (Nutt.) Spreng. M; da, gr, sg.
Conyza canadensis (L.) Cronq. M, W; iw, sg.
Crepis acuminata Nutt. M, W; gr, pj, sg.
Crepis intermedia Gray. M; pj.

- Crepis modocensis Greene. M; sg.
Crepis occidentalis Nutt. M, W; sg.
Echinacea pallida Nutt. M; iw, sg.
Erigeron compositus Pursh. M; or.
Erigeron engelmannii A. Nels. M; sg.
Erigeron glabellus Nutt. W; rw.
Erigeron ochroleucus Nutt. M; sg.
Erigeron pumilus Nutt. M; sg.
Gaillardia aristata Pursh. M, W; pj.
Grindelia squarrosa (Pursh) Dunal. M, W; da, gr, sg.
Gutierrezia sarothrae (Pursh) Britt. & Rusby. M, W; gr,
rh, sg.
Haplopappus armerioides (Nutt.) Gray. M; rh, sg.
Haplopappus spinulosus (Pursh) DC. M, W; sg.
Helianthus annuus L. M, W; da, gr, sg.
Helianthus maximilianii Schrad. M; gr, iw.
Helianthus petiolaris Nutt. M; da, gr, sg.
Hymenopappus filifolius Hook. M, W; gr, rh, sg.
Iva xanthifolia Nutt. M, W; da, iw, sg.
Kuhnia eupatorioides L. M, W; sg.
Lactuca pulchella (Pursh) DC. M, W; gr, sg.
Lactuca serriola L. M, W; da, gr, sg.
Liatris punctata Hook. M, W; gr, sg.
Lygodesmia juncea (Pursh) D. Don. M, W; gr, sg.
Machaeranthera canescens (Pursh) Gray. M; da, gr, sg.
Machaeranthera grindelioides (Nutt.) Keck & Cronq. M, W;
sg.
Machaeranthera tanacetifolia (H.B.K.) Nees. M, W; gr, sg.
Microseris cuspidata (Pursh) Schultz-Bip. W; sg.
Ratibida columnifera (Nutt.) Woot. & Standl. M, W; gr,
iw, sg.
Senecio canus Hook. M, W; rh, sg.
Senecio integrerrimus Nutt. W; gr, sg.
Senecio plattensis Nutt. M; sg.
Solidago canadensis L. W; rw.
Solidago missouriensis Nutt. M, W; sg.
Solidago mollis Bartl. M; gr, iw.
Solidago nemoralis Ait. M; iw, sg.
Solidago rigida L. M; iw, sg.
Sonchus uliginosus Bieb. M; cb.
Stephanomeria runcinata Nutt. M; rh, sg.
Tanacetum vulgare L. M, W; rb, rw.
Taraxacum officinale Weber. M, W; gr, sg.
Townsendia hookeri Beaman. M, W; gr, rh.
Tragopogon dubius Scop. M, W; gr, sg.
Xanthium strumarium L. M, W; da, iw, rw.
- CONVOLVULACEAE
- Convolvulus arvensis L. M, W; da, rw.
Convolvulus sepium L. M, W; rw.
Evolvulus nuttallianus R. & S. M, W; rh, sg.

CORNACEAE

Cornus stolonifera Michx. W; rw.

CRUCIFERAE

Alyssum alyssoides L. W; gr.

Alyssum desertorum Stapf. M, W; sg.

Arabis holboellii Hornem. M, W; sg.

Armoracia rusticana Gaertn., Mey. & Scherb. M; cb.

Camelina microcarpa Andrz. M, W; gr, iw, sg.

Chorispora tenella DC. M, W; gr, sg.

Conringia orientalis (L.) Dumort. M; sg.

Descurainia pinnata (Walt.) Britt. M; gr, sg.

Descurainia richardsonii (Sweet) Schultz. M; sg.

Descurainia sophia (L.) Webb. M, W; cb, da, sg.

Draba nemorosa L. W; sg.

Draba reptans (Lam.) Fern. W; pj.

Erysimum asperum (Nutt.) DC. M, W; gr, sg.

Erysimum inconspicuum (Wats.) MacM. M, W; gr.

Hesperis matronalis L. M, W; da, rw.

Lepidium densiflorum Schrad. M, W; sg.

Lepidium perfoliatum L. M, W; sa, sg.

Lesquerella curvipes A. Nels. W; or, pj, rh, sg.

Lesquerella occidentalis Wats. M; or, rh.

Physaria didymocarpa (Hook.) Gray. W; iw, pj, rh.

Rorippa islandica (Oed.) Borbas. M, W; iw, rw.

Sisymbrium altissimum L. M, W; da, gr, sg.

Sisymbrium loesellii L. M, W; da, sg.

Thlaspi arvense L. M, W; gr, iw, sg.

CUCURBITACEAE

Echinocystis lobata (Michx.) T. & G. M, W; rw.

ELAEAGNACEAE

Elaeagnus angustifolia L. W; rm.

Shepherdia argentea (Pursh) Nutt. W; rw.

EUPHORBIACEAE

Euphorbia esula L. M; iw, sg.

Euphorbia robusta (Engelm.) Small. M; sg.

Euphorbia serpyllifolia Pers. M; da, sg.

Euphorbia spathulata Lam. M, W; sg.

HYDROPHYLACEAE

Ellisia nyctelea L. M, W; da, iw, sg.

Phacelia hastata Dougl. M; pj, sg.

Phacelia linearis (Pursh) Holz. M, W; sg.

LABIATAE

Hedeoma drummondii Benth. M, W; pj, sg.

Hedeoma hispida Pursh. M, W; sg.

Lycopus americanus Muhl. M; fm, rw.

Mentha arvensis L. M, W; cb, fm, rb, rw.

Monarda fistulosa L. W; rw.

Nepeta cataria L. W; rw.

Prunella vulgaris L. W; iw, rw.

Scutellaria galericulata L. M; cb.

Stachys palustris L. M, W; iw, rw.

LEGUMINOSAE

- Astragalus bisulcatus (Hook.) Gray. M, W; da, gr, sg.
Astragalus cibarius Sheld. M, W; pj, sg.
Astragalus crassicarpus Nutt. M, W; pj, sg.
Astragalus dasylabris Fisch. M, W; gr, iw.
Astragalus drummondii Hook. W; gr.
Astragalus flexuosus (Dougl.) G. Don. M; sg.
Astragalus giliviflorus Sheld. M, W; gr, rh, sg.
Astragalus missouriensis Nutt. M; gr, sg.
Astragalus purshii Dougl. M, W; gr, sg.
Astragalus spatulatus Sheld. M; pj, sg.
Astragalus stenophyllus T. & G. M; sg.
Astragalus striatus Nutt. W; sg.
Astragalus tenellus Pursh. M; gr, sg.
Caragana arborescens Lam. W; rm.
Glycyrrhiza lepidota Pursh. M, W; iw, pj.
Lupinus argenteus Pursh. M; gr, rh.
Lupinus pusillus Pursh. M; sg.
Medicago lupulina L. M, W; da, gr, rw.
Medicago sativa L. M, W; da, ws.
Melilotus alba Desr. M, W; da.
Melilotus officinalis (L.) Lam. M, W; da, ws.
Onobrychis viciaefolia Scop. M, W; rm.
Oxytropis besseyi (Rydb.) Blank. M; gr, rh, sg.
Oxytropis sericea Nutt. M, W; sg.
Petalostemon candidum Michx. M; gr, sg.
Petalostemon purpureum (Vent.) Rydb. M, W; gr, sg.
Psoralea argophylla Pursh. M; gr, sg.
Psoralea esculenta Pursh. M, W; gr, sg.
Psoralea tenuiflora Pursh. M, W; gr, sg.
Trifolium fragiferum L. W; rw.
Trifolium hybridum L. W; rw.
Trifolium pratense L. M, W; iw, rw.
Vicia americana Muhl. M, W; rw, sg.

LINACEAE

- Linum perenne L. M, W; pj, rw, sg.
Linum rigidum Pursh. M, W; gr, sg.

LOASACEAE

- Mentzelia decapetala (Pursh) Urb. & Gilg. M, W; da, rh, sg.
Mentzelia dispersa Wats. M; iw, sg.

MALVACEAE

- Malva rotundifolia L. M; da.
Sphaeralcea coccinea (Pursh) Rydb. M, W; gr, rh, sg.

NYCTAGINACEAE

- Mirabilis linearis (Pursh) Heimerl. M, W; sg.

OLEACEAE

- Fraxinus americana L. W; rw.
Fraxinus pennsylvanica Marsh. W; rw.

ONAGRACEAE

- Epilobium watsonii Barbey. M; cb.
Gaura coccinea (Nutt.) Pursh. M, W; gr, iw, pj, sg.

- Gaura parviflora Dougl. M, W; da, gr, rw.
Oenothera albicaulis Pursh. M, W; sg.
Oenothera biennis L. M, W; cb, iw.
Oenothera caespitosa Nutt. M, W; rh, sg.
Oenothera serrulata Nutt. M, W; sg.

OROBANCHACEAE

- Orobanche fasciculata Nutt. M, W; sg.
Orobanche ludoviciana Nutt. M; sg.

PLANTAGINACEAE

- Plantago major L. M, W; cb, fp, rw.
Plantago patagonica Jacq. M, W; sg.

POLEMONIACEAE

- Gilia congesta Hook. M, W; pj, rh, sg.
Microsteris gracilis (Hook.) Greene. M, W; iw.
Phlox hoodii Rich. M, W; gr, rh, sg.

POLYGONACEAE

- Eriogonum annuum Nutt. M; da, gr.
Eriogonum flavum Nutt. M, W; gr, rh.
Eriogonum multiceps Nees. M, W; gr, rh, sg.
Polygonum amphibium L. W; aq, rb.
Polygonum aviculare L. M; da.
Polygonum coccineum Muhl. M; fm.
Polygonum convolvulus L. M, W; da, rw.
Polygonum lapathifolium L. M, W; rw.
Polygonum ramosissimum Michx. M; da.
Polygonum sawatchense Small. M; fp.
Rumex crispus L. M, W; cb, fp, iw.
Rumex maritimus L. M, W; fp.
Rumex obtusifolius L. W; rw.
Rumex triangulivalvis (Danser) Rech. M; fp.
Rumex venosus Pursh. M; da.

PRIMULACEAE

- Androsace occidentalis Pursh. M, W; gr, sg.
Dodecatheon conjugens Greene. M, W; sg.
Lysimachia ciliata L. W; iw, rw.

RANUNCULACEAE

- Anemone cylindrica Gray. W; rw.
Anemone multifida Poir. W; rw.
Clematis ligusticifolia Nutt. M, W; rw.
Delphinium bicolor Nutt. M, W; sg.
Ranunculus aquatilis L. W; aq.
Ranunculus cymbalaria Pursh. M, W; cb.
Ranunculus glaberrimus Hook. M, W; sg.
Ranunculus macounii Britt. M, W; cb, rw.
Thalictrum dasycarpum Fisch. & Ave-Lall. W; rw.

ROSACEAE

- Crataegus columbiana How. W; da.
Fragaria vesca L. W; rw.
Fragaria virginiana Duch. W; rw.
Geum canadensis Jacq. W; rw.
Geum triflorum Pursh. M, W; gr, rh, sg.

- Potentilla arguta Pursh. M; iw, ro.
Potentilla norvegica L. M, W; fp, iw, rb, sg.
Potentilla pennsylvanica L. M, W; rw.
Prunus americana Marsh. W; da.
Prunus virginiana L. M, W; iw, rw.
Rosa woodsii Lindl. M, W; iw, rw.

RUBIACEAE

- Galium aparine L. M, W; rw.
Galium boreale L. M, W; rw.

SALICACEAE

- Populus deltoides Marsh. M, W; rw.
Salix amygdaloides Anderss. M, W; rb, rw.
Salix exigua Nutt. M, W; rb, rw.
Salix lasiandra Benth. W; rb, rw.

SANTALACEAE

- Comandra pallida DC. M, W; gr, rh, sg.

SAXIFRAGACEAE

- Ribes aureum Pursh. M, W; cb, rb, rw.
Ribes cereum Dougl. M, W; cb, pj.
Ribes setosum Lindl. M, W; iw, pj, sg.

SCROPHULARIACEAE

- Besseya wyomingensis (A. Nels.) Rydb. M, W; sg.
Castilleja sessiliflora Pursh. M, W; sg.
Collinsia parviflora Lindl. M, W; iw, pj.
Limosella aquatica L. M; aq, tp.
Orthocarpus luteus Nutt. M, W; gr.
Penstemon albidus Nutt. M, W; gr, sg.
Penstemon eriantherus Pursh. M, W; sg.
Penstemon glaber Pursh. W; rw.
Penstemon nitidus Dougl. M, W; pj, sg.
Verbascum thapsus L. W; da, rh.
Veronica americana Schwein. W; cb.
Veronica catenata Pennell. M; cb.
Veronica serpyllifolia L. W; rw.

SOLANACEAE

- Hyoscyamus niger L. M; da.
Physalis longifolia Nutt. M, W; iw, sg.
Solanum rostratum Dunal. M; da, sg.
Solanum triflorum Nutt. M; gr.

ULMACEAE

- Ulmus parvifolia Jacq. W; rm.

UMBELLIFERAE

- Cicuta douglasii (DC.) Coulter & Rose. M, W; cb, fm.
Conium maculatum L. M; da.
Cymopterus bipinnatus Wats. M; sg.
Musineon divaricatum (Pursh) Nutt. M, W; sg.
Osmorhiza longistylis (Torr.) DC. W; rw.
Pastinaca sativa L. M, W; fm, rw.

URTICACEAE

- Parietaria pensylvanica Muhl. M, W; cb, iw, rw.
Urtica dioica L. M; cb, rw.

VERBENACEAE

- Verbena bracteata Lag. & Rodr. M, W; da, gr, sg.
Verbena hastata L. W; rb.

VIOLACEAE

- Viola canadensis L. W; cb.
Viola nuttallii Pursh. M; gr, sg.
 MONOCOTYLEDONAE

AGAVACEAE

- Yucca glauca Nutt. M, W; pj, sg.

ALISMACEAE

- Alisma plantago-aquatica L. W; rb, tp.
Sagittaria cuneata Sheld. M, W; cb, rb.

AMARYLLIDACEAE

- Allium textile Nels. & Macbr. M, W; gr, sg.

COMMELINACEAE

- Tradescantia occidentalis (Britt.) Smyth. M; gr, sg.

CYPERACEAE

- Carex atherodes Spreng. M; cb, fm.
Carex filifolia Nutt. M, W; gr, pj, rh, sg.
Carex nebrascensis Dewey. W; fm.
Carex vulpinoidea Michx. W; rm.
Eleocharis palustris (L.) R. & S. W; cb, rb.
Scirpus americanus Pers. M; cb, fm.
Scirpus olneyi Gray. M; cb, fm.
Scirpus validus Vahl. M, W; fm, rb.

GRAMINEAE

- Agropyron cristatum (L.) Gaertn. M, W; da, gr, rm, sg.
Agropyron dasystachyum (Hook.) Scribn. M; da, rm.
Agropyron elongatum Host. M; da, rm.
Agropyron intermedium (Host) Beauv. M; da, rm.
Agropyron smithii Rydb. M, W; gr, iw, rm, sg.
Agropyron spicatum (Pursh) Scribn. & Smith. M, W; gr, pj, rh.
Agropyron trachycaulum (Link) Malte. M, W; da, rm.
Agropyron trichophorum (Link) Richt. M; da, rm.
Agrostis alba L. W; rb, rw.
Andropogon gerardii Vitman. W; iw.
Andropogon hallii Hack. M; gr.
Andropogon scoparius Michx. M, W; gr, rh.
Aristida fenderiana Steud. M, W; pj, rh, sg.
Aristida longiseta Steud. M, W; rh, sg.
Avena fatua L. W; da.
Avena sativa L. W; da.
Beckmannia syzigachne (Steud.) Fernald. M, W; fm, rw.
Bouteloua curtipendula (Michx.) Torr. M, W; gr, rh.
Bouteloua gracilis (H.B.K.) Lag. M, W; gr, sg.
Bromus inermis Leyss. M, W; ws.
Bromus japonicus Thunb. M, W; ws.
Bromus tectorum L. M, W; ws.
Calamovilfa longifolia (Hook.) Scribn. M, W; gr, rh.
Dactylis glomerata L. M, W; rb.

- Distichlis stricta (Torr.) Rydb. M; gr, sa.
Echinochloa crusgalli (L.) Beauv. M; cb, rb.
Elymus canadensis L. M, W; cb, sg.
Elymus cinereus Scribn. & Merr. M; cb, sg.
Elymus macounii Vasey. M; da, gr.
Elymus triticoides Buckl. M; iw.
Eragrostis cilianensis (All.) Lutati. M; gr, sg.
Festuca octoflora Walt. M, W; gr, sg.
Glyceria grandis S. Wats. M; cb, fm.
Glyceria striata (Lam.) A. S. Hitchc. W; cb.
Hordeum caespitosum Scribn. M; cb, iw.
Hordeum jubatum L. M, W; ws.
Hordeum pusillum Nutt. M; gr, sa.
Hordeum vulgare L. M, W; da.
Koeleria cristata (L.) Pers. M, W; gr, sg.
Muhlenbergia asperifolia (Nees & Mey.) Parodi M, W; iw,
tp.
Muhlenbergia cuspidata (Torr.) Rydb. M, W; gr, sg.
Munroa squarrosa (Nutt.) Torr. M, W; da, gr, sg.
Oryzopsis hymenoides (Roem. & Schult.) Ricker. M, W; gr,
sg.
Panicum capillare L. W; da.
Panicum miliaceum L. M; rm.
Phalaris arundinacea L. M; cb.
Phleum pratense L. W; rw.
Poa arida Vasey. W; sg.
Poa bulbosa L. W; da.
Poa canbyi (Scribn.) Piper. W; sg.
Poa longiligula Scribn. & Will. M; sg.
Poa palustris L. M; rw.
Poa pratensis L. M; iw, sg.
Poa secunda Presl. M, W; gr, sg.
Schedonardus paniculatus (Nutt.) Trel. M, W; gr, sg.
Setaria viridis (L.) Beauv. M, W; da, rm.
Spartina pectinata Link. M, W; cb, rb.
Sporobolus airoides (Torr.) Torr. M; sg.
Sporobolus cryptandrus (Torr.) Gray. M, W; gr, rh, sg.
Stipa comata Trin. & Rupr. M, W; gr, sg.
Stipa viridula Trin. M, W; gr, rm, sg.

IRIDACEAE

- Sisyrinchium angustifolium Mill. M, W; iw.

JUNCACEAE

- Juncus bufonius L. M; cb.
Juncus longistylis Torr. M; iw.
Juncus nodosus L. W; rb.
Juncus torreyi Cov. M; iw.

LEMNACEAE

- Lemna minor L. W; aq.

LILIACEAE

- Asparagus officinalis L. M, W; iw, rw.
Calochortus nuttallii Torr. M, W; sg.

- Disporum trachycarpum (Wats.) Benth. & Hook. W; rw.
Leucocrinum montanum Nutt. M, W; gr, sg.
Smilacina stellata (L.) Desf. M, W; rw.
Smilax herbacea L. W; rw.
Zigadenus venenosus Wats. M, W; gr, pj, sg.

POTAMOGETONACEAE

- Potamogeton foliosus Raf. M; aq, tp.
Potamogeton nodosus Poir. M; aq, tp.
Potamogeton pectinatus L. M; aq, tp.
Potamogeton richardsonii (Bennett) Rydb. M; aq, tp.

TYPHACEAE

- Typha latifolia L. M, W; fm.

ZANNICHELLIACEAE

- Zannichellia palustris L. M; aq, tp.

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